

Thematic Unit for ELL's

Scope and Sequence

Theme: News & Media

Grade Level: 6th

Proficiency Levels: Expanding/Bridging

Day #	Lesson Focus	Content Objectives	Language Objectives	Activities
1	Social Studies: Using local and national newspapers to become aware of a way society transmits news and culture	<p>Students will become familiar with newspapers and be able to explain why societies use them to transmit information.</p> <p>Students will be able to complete a Newspaper Scavenger Hunt that introduces political, social, and economic issues.</p>	<p>Students will use written sources to discover information</p> <p>Students will converse with peers using the key vocabulary correctly.</p>	Newspaper scavenger hunt
2	Science: Understanding graphene and its relation to newspapers	<p>Students will develop understanding for the concept of graphene in a meaningful way using a vocabulary 4-square.</p> <p>Students will be able to explain graphene's significance in relation to newspapers.</p>	<p>Students will work collaboratively in a jigsaw activity to read part of an article on graphene.</p> <p>Students will verbally explain their assigned part of the article to their group and ask and answer clarification questions when necessary.</p>	<p>Vocabulary 4-square</p> <p>Jigsaw reading</p> <p>E-chart graphic organizer</p>

3	Language Arts: Reader's Theater of <u>The True Story of the Three Little Pigs</u> by Jon Scieszka	<p>Students will be able to explain how the point of view from which the story is written influences the interpretation of the story.</p> <p>Students will be able to compare and contrast the fractured fairy tale with the traditional one.</p>	<p>Students will recite with a partner their part in the Reader's theater performance.</p> <p>Students will use the key vocabulary in discussing the story.</p>	Reader's Theater
4	Math: Using the sports section of the newspaper to calculate mean, median, mode and range	<p>Students will be able to calculate mean, median, mode and range without a calculator.</p> <p>Students will be able to calculate mean, median, mode and range with a calculator.</p>	<p>Students will be able to synthesize, analyze, and evaluate information in groups.</p> <p>Students will be able to locate information appropriate to an assignment in text or reference materials</p>	<p>Sports section search activity</p> <p>Calculations</p>
5	Art: Creating collages from news photographs	<p>Students will be able to choose pictures to include in a collage from news magazines to illustrate an idea or belief.</p> <p>Students will use news magazines to create a collage that has personal meaning and communicates a</p>	<p>Students will be able to express their personal feelings and ideas when talking about their collage.</p> <p>Students will be able to give constructive written feedback to peers' collage projects.</p>	<p>Scanning newspapers and magazines</p> <p>Creating collages</p> <p>Presenting collages to a group</p>

		message about themselves.		
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SIOP® Lesson Plan: Social Studies

Grade: 6th

Unit Theme: News media

Proficiency Levels: Expanding/Bridging

Day: 1

Time allotment: 60 minutes

STANDARDS:

STATE GOAL 18: Understand social systems, with an emphasis on the United States.

18. A.3: Explain how language literature, the arts, architecture and traditions contribute to the development and transmission of culture

TESOL standards:

Goal 1, Standard 3

To use English to communicate in social settings: Students will use learning strategies to extend their communicative competence

LESSON TOPIC:

Becoming familiar with the newspaper as a transmitter of culture and news.

OBJECTIVES:

Language:

- Students will use written sources to discover information
- Students will converse with peers using the key vocabulary correctly.

Content:

- Students will become familiar with newspapers and be able to explain why societies use them to transmit information.
- Students will be able to complete a Newspaper Scavenger Hunt that introduces political, social, and economic issues.

KEY VOCABULARY:

- Journalism
- Mass media
- Newspaper
- Article
- Headline
- Editor

MATERIALS:

- Various newspapers, both local and national
- “Newspaper Scavenger Hunt”

MOTIVATION/ PRESENTATION:

(Building background language and content objectives, comprehensible input, strategies, interaction, feedback) (20 minutes)

This social studies lesson is meant to introduce the entire news unit, as well as be a lesson in itself. So, there will be a significant amount of previewing and pre-teaching of the lesson in order to assess the students’ background with news media, specifically newspapers, and their prior knowledge of the subject.

The teacher should preview the lesson in the students’ L1, prompting them with realia of newspapers. First, she should introduce key vocabulary, and then do a think-aloud, encouraging student participation as well, with questions like “Where do we get newspapers? What does a newspaper have in it? Why do people read newspapers?” Then, she should ask the students to do a Think Pair Share about their experience with newspapers, and encourage them to speak about their country’s newspapers if they are immigrants. The main goal of this activity is to get the students to begin to understand that newspapers have a function in society, to communicate to the people of a country, state, community, etc. The teacher should tell the students that they will get a chance to explore some newspapers today to better understand them.

PRACTICE/APPLICATION:

(Meaningful activities, interaction, strategies, practice/application, feedback) (30 minutes)

The teacher will group the students in groups of 3. The students will all receive “Newspaper Scavenger Hunt” activities. The teacher should go over (model) how to complete the scavenger hunt, completing the first task with the students. Once the teacher feels the students have mastered the activity on their own, she will circulate the room, meeting with the students and trying to guide their hunt when needed. The students will be expected to write their answers to the hunt out, or depending on their proficiency level, may cut out headlines, stories, etc. that pertain to the question and attach them to a piece of paper.

REVIEW/ASSESSMENT:

(Review objectives and vocabulary, assess learning) (10 minutes)

After completing the scavenger hunt, the whole class will come together and the teacher will invite students to share something they found by completing the activity. In order to emphasize the overall meaning of the activity, the teacher should always ask the students, “How does that story communicate information to the reader and why is it important?” or some variation of the question. The teacher should assess the students’ completion of the assignment in order to shape the rest of the week’s instruction.

EXTENSION:

Students should be invited to bring in newspapers they may have from their own communities, countries, or some they have in their homes to share with the class during the week.

SIOP® Lesson Plan: Science

Grade: 6th

Unit Theme: News media

Proficiency Levels: Expanding/Bridging

Day: 2

Time allotment: 60 minutes

STANDARDS:

STATE GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.

13. A.3b: Analyze historical and contemporary science cases in which the work of science has been affected by both valid and biased scientific practices.

TESOL standards:**Goal 2, Standard 1:**

To use English to achieve academically in all content areas: Students will use English to interact in the classroom

LESSON TOPIC:

Learning about the mineral graphene and its application to newspapers

OBJECTIVES:

Language:

- Students will work collaboratively in a jigsaw activity to read part of an article on graphene.
- Students will verbally explain their assigned part of the article to their group and ask and answer clarification questions when necessary.

Content:

- Students will develop understanding for the concept of graphene in a meaningful way using a vocabulary 4-square.
- Students will be able to explain graphene's significance in relation to newspapers through using the E-Chart graphic organizer.

LEARNING STRATEGIES:

- Vocabulary 4-square
- Jigsaw activity
- E-Chart graphic organizer

KEY VOCABULARY:

- | | | |
|---------------|---|------------------|
| 1. Graphite | } | From the article |
| 2. Carbon | | |
| 3. Atom | | |
| 4. Transistor | | |

MATERIALS:

- “Graphene’s Superstrength” article from Sciencenewsforkids.org
- Vocabulary 4-square organizers

MOTIVATION/ PRESENTATION

(Building background, language and content objectives, comprehensible input, strategies, interaction, feedback)(30 minutes)

The teacher will preview the lesson by presenting the key vocabulary of the science article reading. She will say each word, and have the students do a Think-Pair-Share after each. Then, to further their knowledge on the words, each student will be given a number, which correlates to a vocabulary word (1-4). (Students will be sitting in groups of 4). They will complete a vocabulary 4-square with the word, using any resources necessary (classroom or online dictionaries, etc).

After completing their vocabulary 4-square, the students will receive the article “Graphene’s Superstrength.” The article has been split (and numbered) into 4 sections, and the students will use the number of the vocabulary word to correlate to the section of the article they read. Students will then leave their groups with each number represented to meet with the students who share the same number. In those groups, the students will read their section of the article aloud, using their peers for help in comprehending the passage.

PRACTICE/APPLICATION:

(Meaningful activities, interaction, strategies, practice/application, feedback) (25 minutes)

Once the groups have finished reading their assigned parts, they will regroup with the groups where each number is represented. Now the group collectively will have read the entire article. Student #1 will start explaining their part of the article, followed by #2, and so on. While doing this, the students will complete a shared “E-Chart” graphic organizer to summarize the article and enhance their understanding of the science concept of graphene and relation to newspapers.

REVIEW/ASSESSMENT:

(Review objectives and vocabulary, assess learning)

At the end of the jigsaw activity, the teacher will lead a discussion inviting students to review the main idea of the article, and how it relates to newspapers. The teacher will informally assess throughout the lesson the students’ interaction and participation in groups. The teacher will collect both the individual students’ vocabulary 4-squares as well as the groups’ graphic organizers to assess their comprehension of the current event science concept.

EXTENSION:

The article talks about doing a small scientific experiment to learn more about graphene. As an extension activity for science, the students can perform that experiment. It involves a pencil,

tape, and a piece of paper to see the graphite and the layers of graphene. See the article for specifics.

SIOP® Lesson Plan: Language Arts

Grade: 6th

Unit Theme: News media

Proficiency Levels: Expanding/Bridging

Day: 3

Time allotment: 60+ minutes (can be done as a 2-day or extended 1-day lesson)

STANDARDS:

STATE GOAL 1: Read with understanding and fluency.

1. C. 3b: Interpret and analyze entire narrative text using story elements, point of view and theme.

1. C. 3c: Compare, contrast, and evaluate ideas and information from various sources and genres.

TESOL standards:

Goal 1, Standard 3:

To use English to communicate in social settings: Students will use learning strategies to extend their communicative competence

LESSON TOPIC:

Reader's Theater of The True Story of the Three Little Pigs! by A. Wolf as told to Jon Scieszka

OBJECTIVES:

Language:

- Students will recite with a partner their part in the Reader's theater performance.
- Students will use the key vocabulary in discussing the story.

Content:

- Students will be able to explain how the point of view from which the story is written influences the interpretation of the story.
- Students will be able to compare and contrast the fractured fairy tale with the traditional one.

LEARNING STRATEGIES:

- Reader's Theater
- Graphic organizers

KEY VOCABULARY:

- Perspective
- Editorial
- Exposé
- Interview

MATERIALS:

- The True Story of the Three Little Pigs! by A. Wolf as told to Jon Scieszka
- Reader's theater text adaptation by Bridget Scofinsky (see attached)
- Basic props for the story (pretend microphones for reporters, paper pig noses for pigs, etc)
- Venn Diagram graphic organizers

MOTIVATION/PRESENTATION:

(Building background, language and content objectives, comprehensible input, strategies, interaction, feedback) (20-30 minutes)

In order to familiarize all the students with the story of the Three Little Pigs, the teacher will facilitate a whole-class discussion to try to concisely retell the traditional fairy tale. As students give summary points, the teacher will add them to the board. At the end, there will be a summary of the main details of the Three Little Pigs visually represented on the board.

The teacher will then preview the story The True Story of the Three Little Pigs! by doing a picture walk with the students. The teacher should point out how the story is laid out like a newspaper, and prompt the students to think why that might be important. After doing this, the teacher will ask the students to turn to a partner and predict how the story might be different from the traditional story. The teacher should then read the story aloud, having the students try to pay special attention to the characters in the story.

After reading the story, the students will do a Think-Pair-Share activity about the book, discussing both plot and what made the story different than the traditional fairy tale. After doing this activity, the students will go back to their groups and complete a group Venn diagram comparing Scieszka's story to the traditional story.

PRACTICE/APPLICATION:

(Meaningful activities, interaction, strategies, practice/application, feedback) (40 minutes to practice, an additional allotted time to perform the Reader's theater)

Once the teacher feels the students understand the relationship between the traditional story and the Wolf's perspective, the teacher will assign each part of the story to two people. In doing this, when the students perform the story, they will have additional reading support. Also, there are 12 parts, so if the classroom has 24 students, the partnering allows for everyone to have a part. The students will be given a significant amount of time to practice their parts, and the teacher will go around and help the students if needed.

Once the students are adequately prepared, they will perform their reader's theater (with scripts).

REVIEW/ASSESSMENT:

(Review objectives and vocabulary, assess learning) (15 minutes)

As a wrap-up activity, the teacher will lead a discussion about why the story was told using a newspaper. The students will use the knowledge they acquired from practicing reader's theater to

come up with ideas to share with the group. In order to assess this lesson, the teacher should observe students' participation in the Reader's Theater, as well as the completed Venn diagram.

EXTENSION:

Students may want to perform their Reader's theater for another class, teachers, or even parents.

SIOP® Lesson Plan: Math

Grade: 6th

Unit Theme: News media

Proficiency Levels: Expanding/Bridging

Day: 4

Time allotment: 60 minutes

STANDARDS:

STATE GOAL 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

10. A. 3b: Compare the mean, median, mode and range, with and without the use of technology.

TESOL standards:

Goal 2, Standard 2

To use English to achieve academically in all content areas: Students will use English to obtain, process, construct, and provide subject matter information in spoken and written form

LESSON TOPIC:

Using sports statistics in the newspaper to apply mean, median, and mode.

OBJECTIVES:

Language:

- Students will be able to synthesize, analyze, and evaluate information in groups.
- Students will be able to locate information appropriate to an assignment in text or reference materials

Content:

- Students will be able to calculate mean, median, mode and range without a calculator.
- Students will be able to calculate mean, median, mode and range with a calculator.

LEARNING STRATEGIES:

- Using authentic sources to do apply real-world calculations

KEY VOCABULARY:

- Mean
- Median
- Mode

- Statistics

MATERIALS:

- Sports section of newspapers
- Whiteboards
- Calculators

MOTIVATION/PRESENTATION:

(Building background language and content objectives, comprehensible input, strategies, interaction, feedback) (25 minutes)

The teacher should preview the lesson, by introducing the key vocabulary. In order to do this, the teacher will pass out index cards to some students with the vocabulary words on it. While explaining the terms, the teacher will have the student who thinks their word corresponds to the definition and explanation she is giving to bring the term up to the front. The student will put the term on the board, and help create a definition in their own words. After all the terms have been defined, there will be a visual dictionary on the board for students to reference while completing the rest of the lesson.

After the introduction of the lesson, the teacher will provide a string of numbers, and model a think aloud as to how to identify each measure of central tendency with the students. During this modeling activity, the students should get opportunities to practice finding each measure with their group after the teacher has modeled it. The students will not use calculators for this activity.

Once the teacher feels that students have had enough guided practice, she will introduce the sports section of the newspaper, and point out the basketball statistics. The teacher will assign groups different players' statistics, and tell them their task is to find the mean, median, mode, and range of those numbers (The teacher must do preparation for this before presenting the lesson).

PRACTICE/APPLICATION:

(Meaningful activities, interaction, strategies, practice/application, feedback) (25 minutes)

Groups will then be given time to complete their data analysis. Students may use calculators for this task. The teacher should walk around the room and help groups with any difficulties they may have with the task.

REVIEW/ASSESSMENT:

(Review objectives and vocabulary, assess learning) (10 minutes)

In order to do a quick end of lesson check for understanding, the teacher should give a string of numbers on the chalkboard, and direct the students to first find the mean, then the median, mode, and the range on their whiteboards. This allows for the teacher to do an informal assessment as to who has mastered the concept and who might need more work.

EXTENSION:

The teacher can personalize this activity more to the students' interests by using different sports statistics that interest the students.

SIOP® Lesson Plan: Art

Grade: 6th

Unit Theme: News media

Proficiency Levels: Expanding/Bridging

Day: 5

Time allotted: 55-60 minutes

STANDARDS:

STATE GOAL 26: Through creating and performing, understand how works of art are produced.

26. B. 3d: Demonstrate knowledge and skills to create two and three dimensional works and time arts that are realistic, abstract, functional, and decorative.

TESOL standards:

Goal 1 Standard 2: To use English to communicate in social settings: Students will interact in, through, and with spoken and written English for personal expression and enjoyment.

LESSON TOPIC:

Creating picture collages using news magazines and newspapers

OBJECTIVES:

Language:

- Students will be able to express their personal feelings and ideas when talking about their collage.
- Students will be able to give constructive written feedback to peers' collage projects.

Content:

- Students will be able to choose pictures to include in a collage from news magazines to illustrate an idea or belief.
- Students will use news magazines to create a collage that has personal meaning and communicates a message about themselves.

KEY VOCABULARY:

- Photojournalism
- Collage
- Current Events

MATERIALS:

- Various Time, Newsweek, other news magazines/various local and national newspapers

- Paper
- Markers
- Glue
- Scissors

MOTIVATION& PRESENTATION:

(Building background, language and content objectives, comprehensible input, strategies, interaction, feedback) (15 minutes)

In order to introduce the lesson, the teacher will have various newspapers and magazines laid out at various places around the classroom. There will be at least one for each student placed around the classroom. The teacher will explain that today the students will be looking at the pictures in the magazines and newspapers and using them to express their own ideas. The students will get to physically walk to a magazine around the room, and the teacher will give 15 seconds to look through the magazines at the pictures, scanning them. After 15 seconds, the students will rotate and look at another magazine/newspaper for 15 seconds. They will be allowed to tear out pictures if they would like. After the students have had the chance to look at 4 or 5 different magazines or newspapers, the class will regroup.

The teacher will then ask the students to turn to a partner and describe some of the different pictures they saw, and how they made them feel. After students have shared with a partner, the teacher will invite the students to share as a whole class.

The teacher will then model a sample of a news collage she has created using photos from different sources. She will choose several pictures and explain why she picked the pictures, what they mean to her, and how they are important in current events. This is meant to model the oral sharing exercise the students will be expected to complete at the end of the lesson.

PRACTICE/APPLICATION:

(Meaningful activities, interaction, strategies, practice/application, feedback) (30 minutes)

The students will be given the opportunity to create their own collage. They will get time to locate, cut out, and create their collage. The teacher should remind them that they must keep in mind reasons for choosing the pictures and may want to write down notes to use, because at the end they will get to present their collage to some of their classmates. While the students are working, they are encouraged to talk to their peers to get feedback about their collages. The teacher should walk around and do mini conferences with the students about their picture choices during the work time.

REVIEW/ASSESSMENT:

(Review objectives and vocabulary, assess learning) (10-15 minutes)

When students have completed their collages, they will be asked to share their work with a small group of 3-4 students. In presenting their collage, they should mention:

- a) Why they picked the photographs they did
- b) How the photographs influence their feelings and ideas
- c) Why the photos are important in current events

In sharing, the students should be encouraged to offer constructive feedback about their peers' work, offering praise, advice, or asking questions to clarify. Each peer in the group will be expected to write down at least one piece of constructive criticism to be turned in for teachers' assessment of their meeting the language objective.

In order to informally assess, the teacher should walk around and monitor students'

contributions in presenting and providing feedback. She should also monitor to see that students have completed a collage.

Unit Summative Assessment:

As this is the last lesson of the unit, the collage will act as the culminating assessment for the unit. In order to complete the collage, the students have to understand how to critically analyze media to pick out images and understand the key vocabulary to talk to their peers about their projects and offer critical feedback. The collage will be graded using a rubric that looks at these aspects of the project:

- Student created a collage that reflects his or her understanding of news media
- Student participated in discussion about the collage
- Student offered oral feedback using key vocabulary correctly and that demonstrated an understanding of it as applied to news media
- Effort is evident in the creation of the students' collage

EXTENSION:

For an extension to this lesson and overall unit, the teacher can provide a weekly newspaper displayed in the class and an interactive bulletin board where students can cut out headlines, photographs, or other significant parts to be displayed in the classroom. By doing this, students are aware of the importance of news media in daily life, and they are able to participate in communicating it.

Dec. 17, 2008

Graphene's Superstrength

Stephen Ornes

Big technology comes in tiny packages. New cell phones, music players and personal computers get smaller every year, which means these electronics require even smaller components on the inside. Engineers are looking for creative ways to build these components, and they've turned their eyes to graphene, a superthin material that could change the future of electronics.

Graphene isn't just small, it's "the thinnest possible material in this world," says Kostya Novoselov, a scientist who studies graphene at the University of Manchester, in the United Kingdom. He calls it a "wonder material." It's so thin that you would need to stack about 25,000 sheets just to make a pile as thick as a piece of ordinary white paper. If you were to hold a sheet of graphene in your fingers, you'd have no idea because you wouldn't be able to see it.

In addition to being nearly invisible, graphene is also superstrong. In July, engineers at Columbia University in New York City showed that graphene is 200 times stronger than steel, making it the strongest known substance on the planet. Move over, Superman!

Graphene is made of carbon, one of the most abundant elements in the universe. Every known kind of life contains carbon; so do diamonds and coal. Graphene is a sheet of carbon, but only one atom thick. (An atom is the smallest possible piece of an element. If you change an atom of carbon, then it's not carbon anymore.) You don't have to look far to find graphene — it's all around you. You can even try to find some right now.

Do-it-yourself graphene

If you want a sneak peek of this high-tech wonderstuff, all you need is a pencil, paper and a little adhesive tape. Use the pencil to shade a small area on the paper, and then apply a small piece of adhesive tape over the area. When you pull up the tape, you'll see that it pulls up a thin layer of some of the shading from your pencil. That layer is called graphite, one of the softest minerals in the world. When you write with a pencil, you're actually leaving a trail of graphite on the paper.

Now stick the same piece of tape on another sheet of paper and pull the tape up — there should be an even thinner layer, this time left on the paper. Now imagine that you do this over and over, until you get the thinnest possible layer of material on the paper. This layer would be only one atom thick, and you wouldn't be able to see it. Graphite is made of layers of graphene, so when you get to the thinnest possible layer, you've found graphene.

In 2004, scientists used a form of this method (in the laboratory) to isolate graphene for the first time. Those scientists included Novoselov and his Manchester colleague, Andre Geim. Their

success was a huge surprise to the scientific community. Researchers had thought about graphene for a long time, but “for years, it was thought that graphene couldn’t exist,” says Jonathan Coleman, a physicist at Trinity College Dublin, in Ireland.

Since then, scientists like Coleman have been looking for new ways to make and use graphene.

A graphene future

Once scientists can make large amounts of graphene, it could show up in a wide range of applications. Take newspapers, for example. In the next decade or so, says Coleman, newspapers probably won’t be printed on regular paper. Instead, newspaper stories could be displayed on a kind of superthin electric paper, like a computer screen that you can carry around with you. But unlike a computer screen, this electronic paper will be durable and flexible. “You’ll be able to roll it up and fold it and put it in your back pocket,” he says. “It will be flexible and fantastic.”

Because it is strong, thin, transparent and can conduct electricity, graphene is a great candidate for this kind of device. Geim, one of the scientists who first isolated graphene, says graphene could also be used in the production of solar cells, which need materials that can both conduct electricity and let light through.

Graphene might also play a role in the future of cell phones, personal music players or even personal computers. Inside these devices are millions of transistors, tiny electrical switches that control the flow of electricity. Working together, transistors act like the “brain” of a device. The more transistors you have, the faster your computer. As computers get faster and more complicated, scientists are looking for new ways to build smaller transistors. Most transistors are made from silicon.

In early 2008, Novoselov led a team of scientists to build the world’s smallest transistor. It was made of graphene and measured only about 10 atoms across and 1 atom thick. In the laboratory, the scientists showed that the graphene transistor was faster than a silicon transistor. But there’s an interesting problem — graphene transistors are too small to be useful in everyday use! It may be years before computers can use these tiny graphene transistors, Novoselov says, but that day is coming. The future looks bright.

“The beauty of transistors made of graphene is that they can be made very small,” he says. “They will be very fast, and we are searching for ways to make them work even faster.”

“Magic liquids” and the bumpy road ahead

Research into graphene is still in the early stages, so it could be years before we use any devices with the wonder material inside. One of the biggest problems right now is how to make large amounts of graphene. Unfortunately, you can’t buy graphene at your local hardware store. And even if you could, it comes with a hefty price tag. Superstrong and superthin, graphene is also superexpensive.

“In terms of mass, it’s the most expensive material known to man,” says Coleman. To buy an amount of graphene equal to one teeny-tiny slice of one human hair would cost you more than \$1,500. “The United States as a country can afford to buy only about a milligram of graphene per year,” says Novoselov.

In August, Coleman and his team announced they had come up with a solution. They engineered an experiment where they mixed a special liquid with graphite. After they shook the mixture, they noticed that big flakes of graphene started peeling away from the graphite — and sticking to the liquid! Coleman calls such substances “magic liquids,” and so far his team has found ten different kinds. Scientists can use these liquids as an inexpensive way to produce large sheets of graphene.

There’s still a lot of work to do, he says, but “we’ve pointed the direction to where this is going.”

Power Words

carbon: one of the most abundant elements in the universe, found in nature and in all life forms.

atom: the smallest particle of an element that can exist either alone or in combination with other particles

transistor: an electronic device that is used to control the flow of electricity in electronic equipment

graphite: a soft, black lustrous form of carbon that conducts electricity. Also, this is the “lead” in lead pencils.